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(54) Emergency communications system for use in a vehicle

(57) A mobile radio 50 is caused to enter an emergency mode in response to an occupant protection device 30 assuming a protective state. The device 30 may be an airbag, a collapsible steering column, an impact activated seat belt tensioner, or a crumple zone. A horn 60 and hazard warning lights may also be operated when the device 30 assumes its protective state. In emergency mode, the radio 50 may alert a fleet dispatcher, or may notify a base station of the mobile's identity and may request a priority channel to send an emergency signal. The radio 50 may automatically dial a predetermined number for emergency services or an automobile recovery service, and may transmit a prerecorded voice message describing the nature of the emergency. Vehicle position data obtained from a GPS receiver may also be transmitted. The radio 50 may be arranged to operate in a hands-free state in the emergency mode.

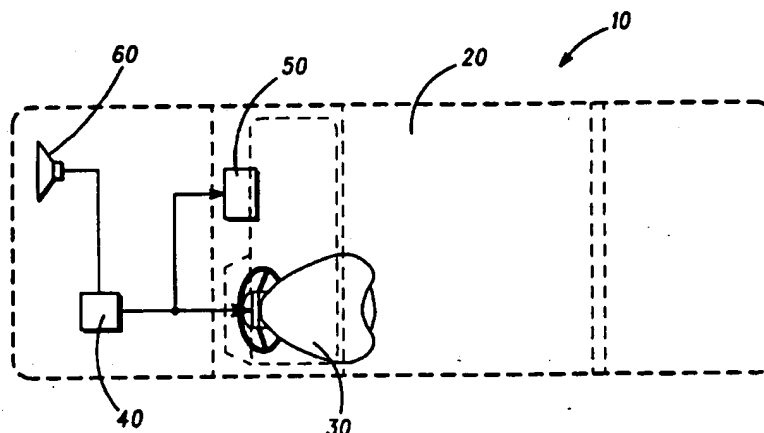


FIG. 1

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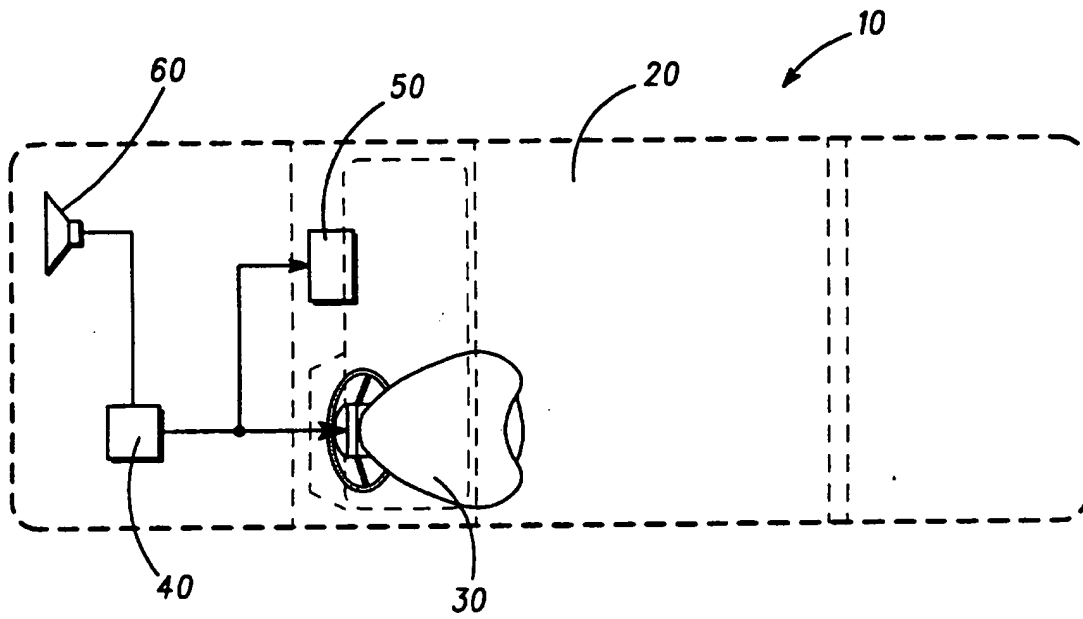


FIG. 1

EMERGENCY SYSTEMField of the Invention

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This invention relates to emergency systems and particularly but not exclusively to emergency systems for use in vehicles.

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Background of the Invention

The average number of road users continues to increase on a daily basis and obviously coupled with this is a continued increase in the number of road traffic accidents (RTAs). While many RTAs occur on motorways and in built up areas, a significant proportion take place at remote or uninhabited areas, where it may take some time for the RTA to be discovered and reported. This problem is particularly acute on seldom used roads and in particular when a vehicle involved in an RTA has left the road, coming to a halt in a ditch or a field. In such cases, discovery of the vehicle may not take place for several hours, since the vehicle is not easily visible from the road (and in many cases completely hidden from view).

It is particularly important that the emergency services arrive at the scene, eliminate further danger and administer first aid as soon as possible. Even after notification and approximate location of an RTA, it is sometimes difficult to locate vehicles, particularly in poor visibility and at night.

If a vehicle involved in an RTA has a mobile radio or telephone unit, it may be possible for an occupant to use the mobile unit to alert the emergency services. However, if the occupant is unconscious, paralysed or in any other way unable to operate the mobile unit, this will not be possible.

This invention seeks to provide an emergency system which mitigates the above mentioned problems.

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Summary of the Invention

According to the present invention there is provided an emergency system for use in a vehicle, the system comprising: an occupant protection device having
5 pre-protective and protective states; sensing means arranged to sense transition of the occupant protection device to the protective state and to produce an output signal in response thereto; and a communications device coupled to receive the output signal from the sensing means, for providing
10 emergency communication in response thereto, wherein activation of the occupant protection device causes the communications device to commence emergency communication.

The occupant protection device is preferably an active device, arranged to activate the protective state upon impact. Preferably, the occupant
15 protection device is an airbag, a collapsible steering column or an impact activated seat belt tensioner.

Alternatively, the occupant protection device is a crumple zone and the sensing means is a sensor arranged to detect crumpling of the crumple zone.
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Preferably the communication device is a mobile radio arranged to enter an emergency operating mode on reception of the output signal from the occupant protection device. The emergency operating mode of the mobile radio preferably includes a pre-programmed emergency procedure.
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Alternatively, the communication device is a mobile telephone arranged to place a call to a predetermined telephone number on reception of the output signal from the occupant protection device. Preferably, the mobile telephone is further arranged to operate in a hands-free mode on reception of the
30 output signal from the occupant protection device.

The emergency system preferably further comprising a vehicle conspicuity device coupled to receive the output signal from the sensing means and arranged to send audible and/or visible signals from the vehicle in response
35 to the received output signal. The vehicle conspicuity device is preferably a vehicle alarm or a set of hazard warning lights attached to the vehicle.

In this way notification of an RTA and location of a vehicle is improved, regardless of whether the occupant is unconscious or paralysed.

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Brief Description of the Drawings

An exemplary embodiment of the present invention will now be described with reference to the drawing of FIG.1 which shows a preferred embodiment of an emergency system in accordance with the present invention.

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Detailed Description of a Preferred Embodiment

Referring to FIG.1, there is shown an emergency system 10, incorporated in a vehicle 20. An airbag 30 which may be housed in a steering wheel or a dashboard of the vehicle 20, is typically arranged to activate when a rapid deceleration of the vehicle occurs, such as in an impact.

A sensor 40 is coupled to the airbag, for sensing activation of the airbag and for providing an output signal in response to the activation. A mobile radio 50 and a vehicle alarm horn 60 are coupled to receive the output signal from the sensor 40.

In normal operation, the mobile radio 50 is used for two-way voice and/or data communication with a base station. The mobile radio 50 is arranged to enter an emergency operating mode upon receipt of the output signal. The emergency operating mode may include notification to a base station of the identity of the mobile radio requesting the emergency mode, requesting of a priority channel for communication and sending of an emergency signal. The vehicle alarm horn 60 is arranged to activate (emit an audible tone) upon receipt of the output signal.

In operation, any rapid acceleration or deceleration force, such as that produced by the impact of the vehicle 20 with another vehicle or a solid object will trigger the airbag 30. The sensor 40 senses activation of the airbag and provides the output signal to the mobile radio 50 and the vehicle alarm horn

60. Thus the mobile radio 50 enters the emergency mode and the vehicle alarm horn 60 is activated.

5 In the case of a fleet of vehicles equipped with mobile radios and a dispatcher having a base station, a mobile radio entering emergency mode will alert the dispatcher to the fact that the vehicle equipped with that mobile radio has a problem. Therefore if the dispatcher knows the route assigned to the vehicle in question, the emergency services can be alerted to the approximate location of the vehicle. Furthermore, triangulation of an emergency signal is possible by a number of base stations and the location of the vehicle may be ascertained in this way. Alternatively a global positioning system (GPS) receiver can be used to provide location information which can be transmitted to the base station in the emergency mode of operation.

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15 Additionally emergency vehicles equipped with tracking devices arranged to detect and 'home in' on the emergency signal can be envisaged.

The vehicle alarm horn 60 serves to make the vehicle conspicuous, aiding in the location of the vehicle by a passing pedestrian, other vehicle or the emergency services.

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It will be appreciated that alternative embodiments to the one described above are possible. For example, the airbag 30 could be replaced by any active protection device such as an impact triggered seatbelt tensioner or collapsing steering wheel, or by a passive protection device, such as a crumple zone. In the latter case, a crumple sensor would be employed to detect crumpling of the crumple zone.

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Furthermore, the mobile radio 50 could be replaced by a mobile radiotelephone, GPS transponder or any similar communications device. In the case of a radiotelephone, the radiotelephone is arranged to dial a predetermined number (for the emergency services or a pre-selected automobile recovery service) and to transmit a pre-recorded voice message describing the nature of the emergency. Voice storage techniques can be used to convey other information such as the vehicle location.

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The vehicle alarm horn 60 could be replaced by any other means for rendering the vehicle 20 conspicuous, such as hazard warning lights, headlights and the vehicle horn.

Claims

1. An emergency system for use in a vehicle, the system comprising:
5 an occupant protection device having pre-protective and protective states;
sensing means arranged to sense transition of the occupant protection device
to the protective state and to produce an output signal in response thereto;
and a communications device coupled to receive the output signal from the
sensing means, for providing emergency communication in response thereto,
10 wherein activation of the occupant protection device causes the
communications device to commence emergency communication.
2. The emergency system of claim 1 wherein the occupant protection
device is an active device, arranged to activate the protective state upon
15 impact.
3. The emergency system of claim 2 wherein the occupant protection
device is an airbag.
- 20 4. The emergency system of claim 2 wherein the occupant protection
device is a collapsible steering column.
5. The emergency system of claim 2 wherein the occupant protection
device is an impact activated seat belt tensioner.
25
6. The emergency system of claim 1 wherein the occupant protection
device is a crumple zone and the sensing means is a sensor arranged to
detect crumpling of the crumple zone.
- 30 7. The emergency system of any preceding claim wherein the
communication device is a mobile radio arranged to enter an emergency
operating mode on reception of the output signal from the occupant
protection device.
- 35 8. The emergency system of claim 7 wherein the emergency operating
mode of the mobile radio includes a pre-programmed emergency procedure.

9. The emergency system of any of the claims 1 to 6 inclusive wherein the communication device is a mobile telephone arranged to place a call to a predetermined telephone number on reception of the output signal from the occupant protection device.

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10. The emergency system of claim 9 wherein the mobile telephone is further arranged to operate in a hands free mode on reception of the output signal from the occupant protection device.

10 11. The emergency system of any preceding claim further comprising a vehicle conspicuity device coupled to receive the output signal from the sensing means and arranged to send audible and/or visible signals from the vehicle in response to the received output signal.

15 12. The emergency system of claim 11 wherein the vehicle conspicuity device is a vehicle alarm.

13. The emergency system of claim 11 wherein the vehicle conspicuity device is a set of hazard warning lights attached to the vehicle.

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14. An emergency system substantially as herein before described with reference to the drawing.

